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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/562,602

12/28/2005

John R Briggs

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35503

7590

05/09/2007

UNION CARBIDE CHEMICALS AND PLASTICS TECHNOLOGY  
CORPORATION  
P.O. BOX 1967  
MIDLAND, MI 48641-1967

EXAMINER

WITHERSPOON, SIKARL A

ART UNIT

PAPER NUMBER

1621

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/562,602	<b>Applicant(s)</b> BRIGGS ET AL.	
	<b>Examiner</b> Sikarl A. Witherspoon	<b>Art Unit</b> 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,4,5,7,8,11-13,15,16,19-23,25-28,30,33 and 34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22,23,25-28,30,33 and 34 is/are allowed.
- 6) ☒ Claim(s) 1,4,5,7,8,11,12,15,16 and 19-21 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/9/06, 6/16/06</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 8, 11, 12, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by packet et al (US 5,886,237).

Packett et al disclose a carbonylation process wherein in butadiene is reacted with carbon monoxide and hydrogen to produce the corresponding alkenal, employing a rhodium complex as catalyst and tris(2-cyanoethyl) phosphine as ligand (col. 55, line 65 to col. 56, line 12). The reaction temperature is 110° C, and the ligand has a pKa of about 1.37. Packett et al do not expressly disclose a method of minimizing the production of phosphonium ion degradation products, as per the instant claims; however, since all of the reaction parameters of the instant claims are disclosed by Packett et al, the reaction disclosed by Packett must inherently minimize the production of these degradation products; *ex parte Novitski*, 26 USPQ2d 1389 (BPAI, 1993). Accordingly, Packett et al anticipate the instant claims.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 5, 16, and 19-21, although not anticipated, are rejected under 35 U.S.C. 103(a) as being unpatentable over Packett et al.

The instant claims further limit the process of the invention to an olefin conversion of between about 80 and 95 weight percent, a reaction temperature of greater than 45° C and less than 95° C.

Packett et al teach a butadiene conversion of about 68% by weight, and a process temperature of 110° C; the pressure is 1000 psig (col. 56, lines 5-9).

However, the examiner takes the position that it would have been obvious to a person having ordinary skill in the art, at the time the present invention was made, to modify process conditions such as temperature and/or pressure, in order to control the level of conversion of the polyolefin and/or selectivity to the desired alkenal.

Claims 1, 4, 5, 7, 8, 11, 12, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guram et al (US 6,034,286).

Guram et al teach a carbonylation process wherein a conjugated diene, such as 1,3-butadiene is reacted with carbon monoxide and hydrogen in the presence of a rhodium complex and a phosphine ligand. The reaction is conducted at about 80° C; table A lists ligands employed in the reaction; examples 1,2, and 4-10 employ ligands having a pKa of less than 8.3 (col. 8, lines 25-42; col. 21, line 55 to col. 22, lines 25). The olefin conversion ranges from 62 to 93 weight percent.

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The primary differences between Guram et al and the instant claims are first, that Guram does not expressly teach a method of minimizing the production of phosphonium ion degradation products, as per the instant claims; however, since all of the reaction parameters of the instant claims are disclosed by Guram et al, the reaction taught by Guram et al must inherently minimize the production of these degradation products.

Second, Guram et al are drawn to the production of alcohols, not unsaturated aldehydes that are the primary product formed in the process of the present invention.

However, the examiner takes the position that since the reaction taught by Guram et al begin with a 1/1 hydrogen/carbon monoxide ratio before increasing to a 3/1 ratio (see col. 21, lines 61-65), it would have been obvious to a person of ordinary skill in the art that unsaturated aldehydes corresponding to the olefinic starting material, i.e., butadiene, are present in the reaction mixture prior to increasing the hydrogen concentration of the reaction effluent. If so desired, a person having ordinary skill in the art could have stopped the reaction after the initial conversion of butadiene in order to isolate pentenals, which are themselves valuable intermediates.

Claim 13 is objected to as being dependent upon a rejected base claim.

The following is a statement of reasons for the indication of allowable subject matter: claims 22, 23, 25-28, 30, 33 and 34 are drawn to a process for reverting a phosphonium ion ligand degradation product back to useful triorganophosphine ligands that are not taught or fairly suggested by the prior art.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikarl A. Witherspoon whose telephone number is 571-272-0649. The examiner can normally be reached on M-F 8:30-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on 571-272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

saw

*Sikarl A. Witherspoon*  
SIKARL A. WITHERSPOON  
PRIMARY EXAMINER